

REMARKS

Amendments to the Claims

Claim 41 has been amended to limit the cathode to (1) a liquid alloy of two or more metals selected from the group consisting of bismuth, lead, tin, antimony, indium, gallium, thallium, and cadmium; or (2) an electrically conductive liquid solvated alkali metal. Basis is in the specification at page 3, lines 18-20, page 8, line 8 bridging to page 9, line 8 (liquid alloy cathode) and page 9, lines 9-28 (liquid solvated alkali metal). Claims 42 and 43 have been cancelled.

Allowable Subject Matter

Examiner objects to claims 44 and 48-50 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Applicants gratefully acknowledge Examiner's comments and respectfully request reconsideration of claims 41 and 44-50 as amended.

Claims Rejections

Examiner rejects claims 41-42 under 35 U.S.C. 102(b) as anticipated by Kaun (U.S. Patent 4,158,720, hereinafter, "Kaun"). Examiner asserts Kaun discloses the claimed cathode comprising a liquid alkali metal at col. 5, lines 36 - 41.

Applicants have amended claim 41 to limit the cathode to (1) a liquid alloy of two or more metals selected from the group consisting of bismuth, lead, tin, antimony, indium, gallium, thallium, and cadmium; or (2) an electrically conductive liquid solvated alkali metal. Applicants respectfully assert Kaun discloses neither (1) nor (2) as cathode. Thus, Applicants respectfully submit that claim 41, as amended, is not anticipated by Kaun under 35 U.S.C. 102(b). Applicants have cancelled claim 42.

Examiner rejects claims 41-43 and 45-47 under 35 U.S.C. 102(b) as anticipated by Ziegler et al. (U.S. Patent 3,234,113, hereinafter, "Ziegler"). Examiner asserts Ziegler discloses the claimed cathode comprising a liquid alkali metal, such as sodium and using an organic solvent comprising an ether in claims 1-14. Applicant respectfully disagrees.

Applicants have amended claim 41 as recited above and have cancelled claims 42 and 43.

Ziegler discloses in claim 1, an electrolyte comprising a compound of the general formula $\text{MeBR}_3\text{R}'$, wherein Me is alkali metal (sodium or a mixture of sodium and potassium), B is boron, R is an alkyl radical and R' is hydrogen, alkyl, or alkoxy. An ether may be added to the electrolyte bath (col. 3, lines 57-64). Ziegler fails to disclose use of an ether as a component of the cathode.

Regarding a cathode, Ziegler refers to cathodes made of copper, brass, iron or nickel and other alloys (see, col. 1, lines 37-40 and by reference, col. 2, lines 24-25). No other mention of cathode composition is mentioned until the Examples. Specifically, Ziegler discloses use of a cathode of sheet copper in Example 1 and a cathode of a screen of copper or iron wire in Example 4.

Thus, Applicants respectfully assert Ziegler fails to disclose a cathode comprising a liquid alkali metal using an organic solvent comprising an ether.

Examiner asserts the specification teaches liquid electrode is formed by liquid metal depositing on the porous metal frame at page 6, lines 14-20. Applicants respectfully disagree. Applicants respectfully assert Examiner's statement is a misinterpretation of the specification. What is recited at page 6, lines 14-20 follows:

During operation of the cell, the liquid alkali metal produced can share in the cathode function with the cathode. Physical means for transporting liquid alkali metal away from the cathode can be machined channels or grooves, a system of holes, or use of porous materials having interconnected pores permitting molten alkali metal to flow into the collection vessel. There are numerous other ways of performing this function which one skilled in the art can devise depending on one's preference.

That the liquid alkali produced can "share" in the cathode function, does not mean "the liquid electrode is formed by the liquid metal depositing on the porous metal frame," as recited by Examiner. It is further recited that porous materials may be used to permit molten alkali metal to flow into a collection vessel, thus removing alkali metal from the cathode. The function of porous material to remove alkali metal contradicts Examiner's statement that the specification teaches liquid electrode is formed by depositing the liquid metal on "the porous metal frame". There is no mention of a "metal frame" in Applicant's specification.

Applicants respectfully assert Ziegler fails to disclose a cathode comprising a liquid alkali metal using an organic solvent such as an ether. Applicants further respectfully assert the specification does not teach the liquid electrode is formed by liquid metal depositing on a porous metal frame. Thus, Applicants respectfully submit that claims 41, as amended, and 45-47, are not anticipated by Ziegler under 35 U.S.C. 102(b).

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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